Space Solar Power Concept Technology Maturation
Technical Interchange Meeting
Glenn Research Center, Cleveland OH
September 10-12, 2002

Output from Working Group Session: Structures, Materials, Assembly and, Thermal

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Table 1

List of Revolutionary Technologies:

1)

2)

3)

Work Breakdown Structure

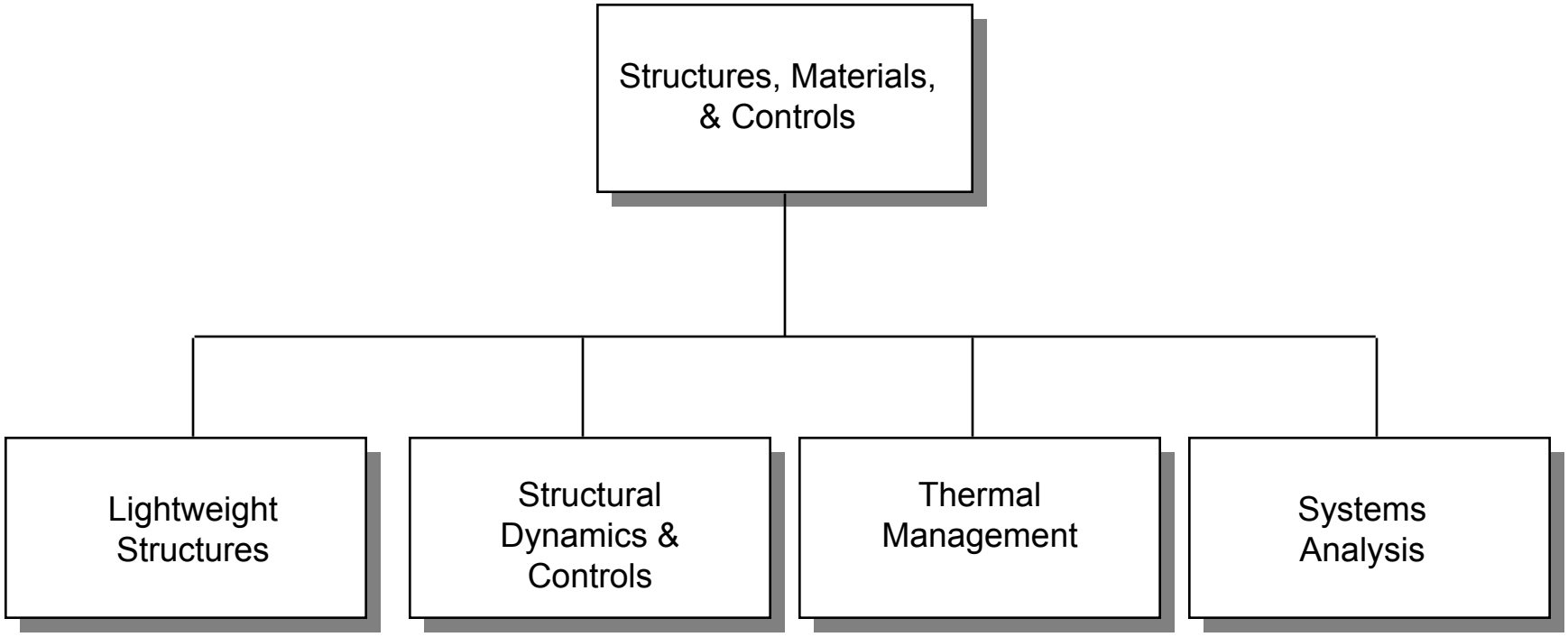

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Table 2

Detailed description and assessment of technologies from Table 1. List the impact to the SSP goals and the other related technologies:

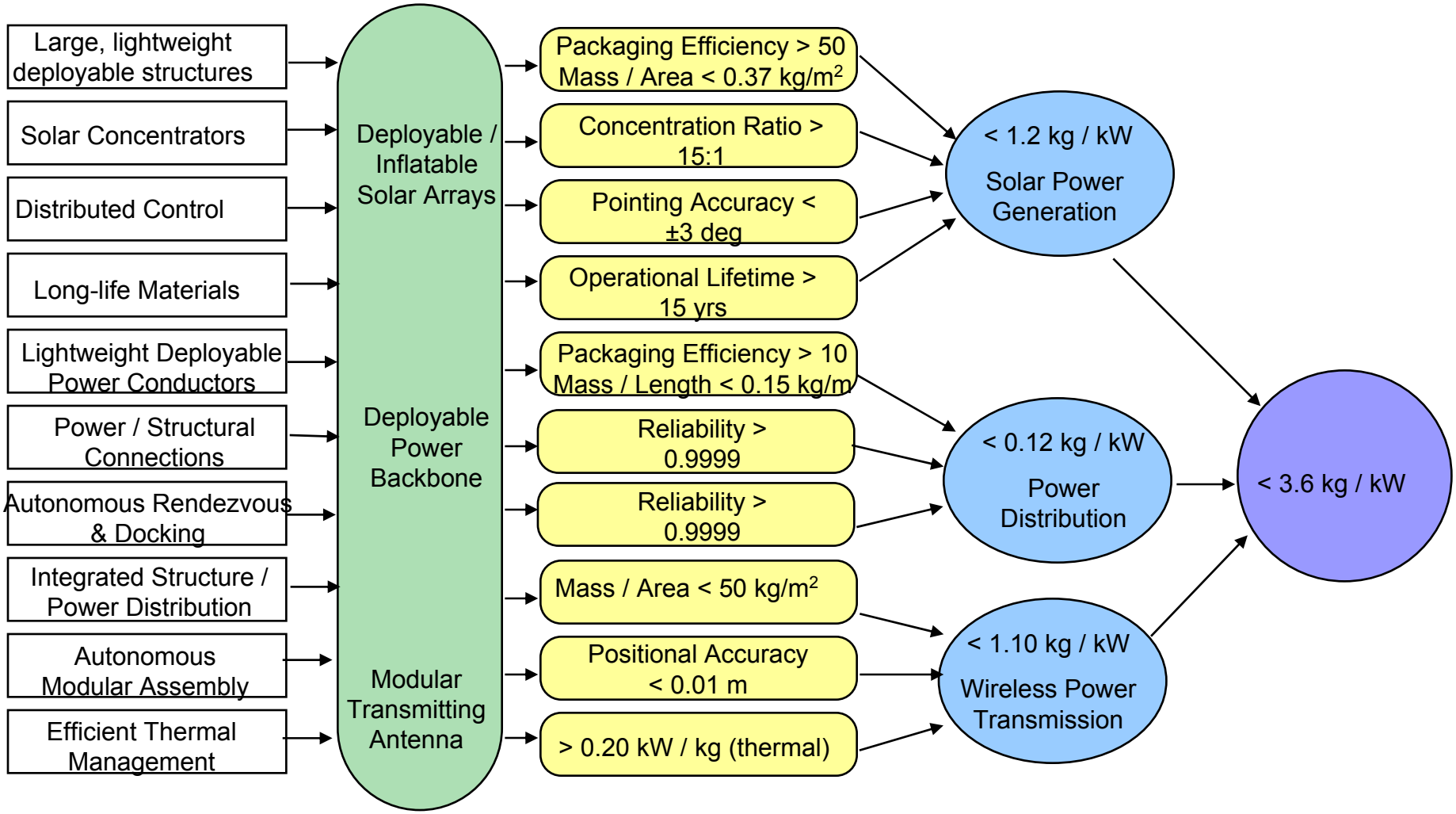
1)

2)

3)

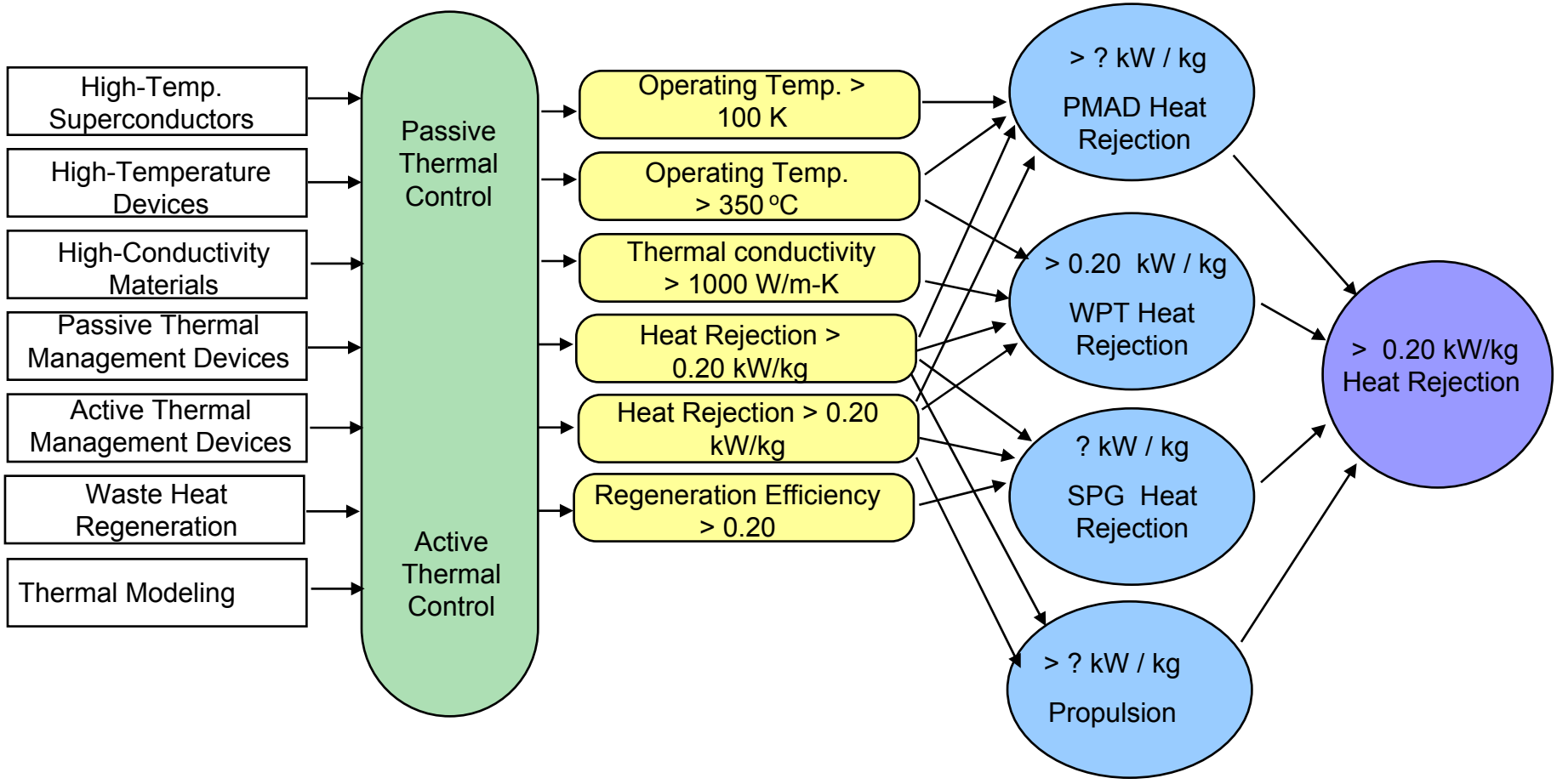
STRUCTURES, MATERIALS, & CONTROLS

Strategic Technology Approach



THERMAL MANAGEMENT

Strategic Technology Approach



Technology Challenges → **System Concepts** → **Performance Objectives** → **Major System Goals** → **Architecture Goal**

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Table 3

Consensus on the future direction of research and development to solve the challenges of SSP:

Near Term:

- Need to baseline a laser based WPT and develop system level model for flow down of requirements to structures, thermal, and controls.
- Evaluate Multifunction arrays (PV, Diodes, MEMS, Thermal, Fiber Optic, Furlable, Packaging,…)
- Perform structural and thermal analysis of baseline for technology benefits assessment.
- Develop packaging schemes for single launch vehicle.

Far Term:

- Evaluate feasibility of solar pumped laser designs.
- Assess modular (scaled) systems (e.g. hybrid laser/microwave WPT)

Summary

- The Structures and Thermal working group needs direction/help from SIWG and others in selecting a configuration for focused effort.

- During this Structures and Thermal working group, the main objective of the team was to evaluate new laser based WPT concepts and discuss thermal requirements.

- Opportunity exists for real advances in integrated design of multifunction arrays (PV, Diodes, MEMS, Thermal, Fiber Optic, Furlable, Packaging, Deployment, …)